STRATEGIC PLAN

for

TROUT MANAGEMENT

A plan for 2002 and beyond

State of California
The Resources Agency
Department of Fish and Game

July 2002 Draft

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State of California
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EXECUTIVE SUMMARY

The purpose of this plan is to identify key issues and concerns relative to trout resources and fisheries in California, and to develop goals and strategies that will address these issues during the next 10 to 15 years and beyond. Our vision for the future includes a plan that enables trout managers to meet public trust responsibilities of protecting and maintaining California=s rich heritage of native trout and other aquatic resources; a plan that promotes the use of sound ecosystem management principles; a plan that provides diverse angling and recreational opportunities; and a plan that increases the general public=s appreciation and awareness of trout and their habitats. We want to consider resource management strategies for meeting the challenges brought on by an increasing population within the State, and possible changing attitudes about recreational fisheries. We want to consider educational opportunities that encourage appreciation of trout resources among a broader spectrum of the population.

Since 1945 the California Department of Fish and Game (CDFG) has implemented its longstanding, very popular, and widespread program of stocking hatchery catchable trout to satisfy angler desires and create recreational opportunities in California. As CDFG implements this strategic plan, it intends to assess and modify as necessary the hatchery program to satisfy the goals and objectives established by this comprehensive systems management planning process. The refinement of hatchery operations, however, will not occur in isolation, but rather within the broader examination of all trout-related programs and practices in California watersheds. A key component of the strategic planning process will be the analysis of the environmental, biological, and social effects of all trout-related programs, including hatchery related activites. Where required by the California Environmental Quality Act (CEQA), environmental documents will be prepared for each significant trout management activity or program.

The scope of this plan includes all species and subspecies of resident (non-anadromous) forms of salmonids including landlocked forms of steelhead, coastal cutthroat trout, and salmon. Presently there are eleven native species or subspecies of trout in California, and three non-native species of trout.

Development of this plan has been the result of participation by focus groups, special interest groups, and hundreds of individuals. We have developed a strategic plan that calls for an ecosystem (watershed) approach and includes strategies that recognize interactions between trout and other aquatic species. This approach is consistent with an ecosystem management strategy stipulated in the CDFG's department-wide strategic plan.

The goals and strategies presented in this plan have been developed around two themes that reflect the general mission of CDFG: 1) Habitat and native species protection and management, and 2) public use, in this case, recreational angling. Critical to the development of this plan, and its subsequent implementation, are overarching themes of communication and education, which are intertwined throughout the two primary themes. The goals and strategies associated with each theme are not prioritized, but protecting and maintaining habitat, and ensuring that native

species populations are not jeopardized must take priority over recreational angling considerations, if conflicts occur.

Theme 1: Habitat and native species protection and management.

Protecting, maintaining, and restoring California's trout resources is an important mission of the CDFG. Preserving habitat is more effective than trying to restore it after it is damaged. Protecting habitat requires knowledge of natural physical and biological interactions within a watershed, and how human manipulation of resources (including industrial, domestic, and recreational uses) affects the watershed=s natural physical and biological functions. Landowners and land managers should be aware of the effects their activities have upon the watershed and the range of options available to eliminate or reduce those impacts. Current information about fish population and habitat status is essential for making sound resource management decisions.

Goal: Use an ecosystem (watershed) approach to trout resource management

Strategies:
- # Define ecosystem management boundaries based on watersheds.
- # Develop a reporting format that encourages consistency for ecosystem management plans.
- # Develop implementation and monitoring plans for each watershed unit.
- # Integrate trout management plans with other resource management within the same watershed.

Goal: Protect and restore aquatic ecosystems

Strategies:
- # Develop a systematic approach to assess trout and other aquatic resources.
- # Protect and maintain natural biological diversity.
- # Increase appreciation for aquatic biodiversity through training and development of appropriate assessment protocols.
- # Develop a fish and aquatic species genetics program.
- # Develop incentives that encourage trout resource protection and restoration.
- # Increase collaborative efforts to protect aquatic ecosystems and ensure maintenance of adequate stream flows.
- # Protect aquatic habitats by land aquistion and conservation easements.
- # Support research activities that improve knowledge for aquatic resource managers and technicians.

Goal: Improve Educational Materials and Communication with Trout-Related Stakeholders

Strategies:
- # Improve the quality and quantity of printed and Internet information to increase awareness of aquatic resource conservation and stewardship.
- # Develop "how to" materials for landowners and managers that demonstrate friendly aquatic resource practices.

- # Collaborate with educators to develop courses that teach and demonstrate conservation and stewardship principles for aquatic resources.

Theme 2: Recreational angling.

Managing trout resources for their use and enjoyment by the public is another principal mission of CDFG trout managers. But, one should recognize that the management of angling activity is merely an element of the broader sphere of fisheries and resource management, which includes protecting and maintaining native and wild species, and their habitats.

Trout anglers comprise a diverse group with a broad spectrum of experience, skill, leisure time, financial means, and angling preferences. Providing angling opportunities to a diverse angling community throughout the State requires knowledge of what various anglers want and how they are represented in the population. To properly address angler preferences, we need to update and improve our knowledge of the types of experiences the angling community is seeking.

We face the challenge of balancing angling diversity needs for wild trout fisheries and hatchery-supported harvest fisheries, while practicing sound fishery and ecosystem management. Unfortunately, we do not have up-to-date information regarding the percentage of anglers preferring wild trout fisheries and limited harvest fisheries, or the percentage of anglers targeting hatchery supported fisheries. These information deficiencies must be addressed, if we are to more effectively manage our recreational trout fisheries to meet the needs of the State=s trout anglers.

Goal: Provide, maintain and enhance diverse trout angling opportunities statewide.

Strategies:
- # Develop an aquatic management classification system that allows fishery management strategies to be easily displayed for specific waters within watersheds.
- # Develop and conduct angler preference and satisfaction surveys at regular intervals.
- # Better utilize wild, self-sustaining trout populations as the most efficient management strategy.
- # Promote the recreational value and appropriate use of hatchery-produced, catchable sized trout.
- # Increase emphasis on developing and supporting urban fisheries.
- # Develop a volunteer angler program for collecting fishery information.
- # Improve angler access to trout fishing waters.

Goal: Improve the effectiveness and efficiency of how hatchery trout are utilized for providing angling opportunities.

Strategies
- # Develop harvest and angler-use criteria for measuring stocking success.

- # Re-evaluate locations, numbers, and frequency of trout stocked.
- # Base hatchery production on angler demand and effectiveness.
- # Investigate the feasibility and management potential for using sterile (triploid) trout in selected waters to avoid potential hybridization with native trout.

Goal: Increase the public's awareness of trout-related recreational opportunities through improved communication and educational sources.

Strategies:

- # Increase the variety of informational brochures, leaflets, videos, and other informational items available in print and on the Internet.
- # Improve the presentation and clarity of angling regulations.
- # Reduce the complexity of trout-related angling regulations.
- # Develop partnerships with fishing organizations and angling related businesses to produce and distribute informational material.
- # Take better advantage of hatchery facilities for educational displays and centers of information

This plan represents the first phase of a four-step cyclical process that includes: 1) planning goals and strategies, 2) planning actions, 3) implementing actions, and 4) monitoring and evaluation. Strategic planning is the initial phase that determines program direction and philosophy. This strategic plan does not address specific issues confined to local geographic areas; actions specific to individual river basins will be identified in the subsequent watershed implementation plans. Rather, this strategic plan is intended to provide broad, overarching, statewide direction for CDFG trout programs.

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California Department of Fish and Game

Strategic Plan for Trout Management

California's rich heritage of native trout species has evolved in waters of the State over thousands of years. The twelve species or subspecies of trout indigenous to California represent one of the most diverse assemblages of trout species in the United States. The coastal rainbow trout (including the anadromous form, steelhead) is the most common and widely recognized of the State's native trout species. The uniquely colored California golden trout is the State=s fish. The other native trout species are: Lahontan cutthroat, Paiute cutthroat, coastal cutthroat, Eagle Lake rainbow, Kern River rainbow, Little Kern golden, McCloud River redband, Goose Lake redband, and Warner Valley redband. The native bull trout is now extinct in California. Little Kern golden, Lahontan cutthroat and Paiute cutthroat, are presently listed as "Threatened" under the federal Endangered Species Act.

Trout angling is California's most popular type of fishery, accounting for approximately 60 percent of angling effort statewide [1/]. A wide range of angling opportunities are available to the novice or experienced trout angler, including those in remote high mountain lakes, streams and rivers throughout the State, foothill reservoirs, and urban waters. Trout fishing and its associated businesses are an important part of the State=s economy. The trout fishing "industry" in California generates an estimated $3 billion in personal income, accounting for over 75,000 jobs (1992 estimate) [2/].

The California Department of Fish and Game (CDFG) is responsible for managing the State's trout resources, and providing a diversity of angling opportunities. While resident trout and inland salmon are the focus of this document, management of these populations and their habitats require broad ecosystem considerations. This document will identify trout management strategies that protect and maintain native trout populations and their habitats, and address interactions between fish and other organisms within aquatic ecosystem communities, while providing recreational and educational enjoyment of the State's resident trout and inland salmon populations.

PURPOSE

The purpose of this plan is to identify key issues and concerns relative to trout resources and fisheries, and to develop goals and strategies that will address these issues during the next 10 to 15 years and beyond. The intended audience for this plan includes internal and external stakeholders with an interest in California's cold water ecosystems and trout fisheries. We want a plan for the future that enables trout managers to meet public trust responsibilities of protecting and maintaining aquatic resources; a plan that promotes the use of sound ecosystem management

1/ Fletcher, J. E. and M. King. 1988. Attitudes andpreferences of inland anglers in the State of California. Final Report to California Department of Fish and Game, Sacramento.

2/ McWilliams , B. and G. Goldman. 1994. Commercial and recreational fishing in California, their impact on the State economy. Univ. of Calif., Berkeley, Dept. of Agriculture and natural Resources.

principles; a plan that provides diverse angling and recreational opportunities; and a plan that increases the general public's appreciation and awareness of trout and their habitats. We want to consider resource management strategies for meeting the challenges brought on by an increasing human population within the State, and possible changing attitudes about recreational fisheries. We want to take advantage of educational opportunities that encourage appreciation of trout resources among a broad spectrum of the population. In essence, we are asking "how can we be more effective in meeting the challenges and taking advantage of opportunities during the next 10-15 years?".

This plan represents the first phase of a cyclical process that includes planning goals and strategies, identifying and implementing actions, and monitoring and evaluating results. Strategic planning is the initial phase that determines program direction and philosophy. This strategic plan does not address specific issues confined to local geographic areas. Rather, this plan is intended to present overarching statewide direction for all trout programs.

Subsequent planning that is more specific to a particular watershed, or implementation of existing stream-specific fishery management plans (Appendix A) will be guided by this overall statewide direction. Whether we are explaining fisheries management actions to interested stakeholders, or justifying the need for additional personnel and funding, this plan will be the basis for defining program goals and direction.

SCOPE

The scope of this plan includes all species and subspecies of resident (non-anadromous) salmonids, including landlocked forms of steelhead, coastal cutthroat trout, and salmon. Presently, there are eleven native species or subspecies of trout in California, and three non-native species of trout existing within State waters (Appendix B). This plan addresses management of these 14 trout species. In addition, it covers two species of Pacific salmon used in lake and reservoir management and utilized by the traditional trout angler. These salmon species are chinook and kokanee (a landlocked sockeye salmon).

Anadromous forms of native trout include steelhead and coastal cutthroat trout. Steelhead are the anadromous form of coastal rainbow trout (*Oncorhynchus mykiss*). Because of genetic similarities between the anadromous and resident forms of coastal rainbow trout within the same watershed, it is difficult to separate management strategies between the two populations. Coastal cutthroat trout are confined to the northwest portion of California in coastal streams and rivers from the Eel River northward. Steelhead and sea-run coastal cutthroat trout populations with migration routes to the ocean are managed under the guidelines of Department's *Steelhead Restoration and Management Plan for California.*

PLAN DEVELOPMENT

Strategic planning: Strategic planning is a participatory process that looks toward the future and considers options for dealing with threats and opportunities. It requires a clear vision of organizational mission, mandates, and responsibilities. In addition, it requires identification of an organization's strengths, weaknesses, opportunities, and threats. The process includes participation by internal and external parties to identify and discuss strategic issues and alternatives to address those issues. An issue is considered strategic if it 1) affects an organization's mandates or responsibilities, 2) has a consequence if not addressed, 3) is something the organization can do something about, and 4) has a range of potential solutions.

This strategic plan addresses high priority issues, and includes potential solutions in the form of goals and strategies. It does not contain implementation objectives and project detail. For example, if an issue includes the problem that managers do not have current resource-status information for making sound and credible decisions, the goal might indicate that additional resource assessment information will be collected. One of the strategies to achieve the goal could be increased angler surveys. The details of where, how, or when the surveys would be conducted are not included in this plan but would be part of the subsequent Implementation Plan.

We have selected a dynamic strategic planning process that integrates four primary elements into a planning, implementation, and evaluation cycle. The four primary elements of the strategic process are:

1. Strategic Plan:	Identifies issues, goals and strategies.
2. Implementation Plan:	Identifies specific prioritized objectives and activities to be accomplished statewide and within each watershed management unit. Integrates existing fishery management plans into this plan (Appendix A).
3. Implementation:	Executes actions to meet specific prioritized objectives.
4. Monitoring/Evaluation	Continuous process for all phases. Measures achievement of objectives and evaluates success of meeting those objectives. Includes re-evaluation of goals and strategies for appropriate direction based on current conditions and issues.

The above model reflects an adaptive management approach that identifies strategies and objectives based on goals for the future. Flexibility is built into the process by measuring and evaluating the success of chosen objectives and actions, and making necessary adjustments to achieve the desired goal. Goals are formed from the vision of the organization, but unforseen obstacles in the path of achieving the goals may require changes in direction to adapt to new events or information. Rather than linear, this model is cyclical (with feedback) and has built-in evaluations to identify where and when adjustments are needed.

BACKGROUND

California presently has eleven species or subspecies of native trout (Appendix B). A twelfth native species, the bull trout, is now extinct in California. The coastal rainbow trout has the most widespread historic range and is the most widely recognized by the public. Three native species, Little Kern golden, Lahontan cutthroat and Paiute cutthroat, are presently listed as "Threatened" under the federal Endangered Species Act.

Three subspecies of redband trout (McCloud, Goose Lake, and Warner Valley) are currently recognized by the CDFG but their status is not fully recognized by the taxonomic community. While the redband taxonomic issue is being studied through genetic analysis, the CDFG has taken a conservative taxonomic approach and considers these trout and their relatively small historic habitats as unique and worthy of recognition and protection as separate subspecies.

Non-native trout species that have become well established and popular among California anglers include brown, brook, and lake (mackinaw) trout (Appendix B). Kokanee and chinook salmon are included in the non-native trout list because they are utilized for recreational purposes by the trout angler in lakes and reservoirs.

The universe of trout management includes two often distinct but highly integrated aspects of resource management. One encompasses the realm of habitat and ecosystem management: the other deals with recreational uses of trout resources. Both have goals of maintaining healthy and robust native species populations, while minimizing the adverse effects of non-native species. However, recreational management of trout resources frequently includes the use of non-native species to increase recreational benefits, while habitat and ecosystem management generally focuses on natural systems and native species. Conflicts in these two management realms are typically settled in favor of native species and natural communities.

Trout are managed in California under policies and guidelines established by the California Fish and Game Commission, that reflect CDFG's dual mission of protecting and restoring native species and their habitats, while providing diverse recreational angling opportunities.

Management of trout is integrated with many other aspects of ecosystem protection, restoration, and maintenance including: a) ensuring adequate stream flows and water quality, b) protecting and restoring riparian communities, c) maintaining natural biological diversity within the aquatic ecosystem, d) restoring native trout populations and other native aquatic species within their historic ranges, and e) preserving genetic integrity of native populations. Managers may highlight trout as the target species but in reality trout management involves ecosystem management.

Management to provide a diversity of recreational angling opportunities consists of appropriate angling regulations and supplemental stocking including: a) regulating harvest to maintain self-sustaining populations, b) regulating the size of fish harvested from wild populations to maximize the numbers of larger fish, and c) stocking hatchery trout to provide recreational angling opportunities that would not otherwise be available, or to increase recreational opportunity in areas of high demand. In addition, angler access to trout fishing areas must be protected and improved.

The mission of the Department of Fish and Game is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

Though the principal goal of CDFG's trout management is to maintain self-sustaining wild populations, hatcheries have played, and will continue to play, a vital role in California's trout management. Trout have been stocked in waters within the State since 1870, mainly to supplement natural populations and to establish fisheries in suitable waters not originally containing trout. In the past, stocking focused primarily on benefitting anglers, and in some cases without regard for potential adverse effects to other species and organisms within the aquatic ecosystem. However, in recent years fishery managers have increased their appreciation and understanding of ecosystem processes and species interactions, and more often consider management practices based on the entire ecosystem, not just the game fish populations.

The role of hatcheries in future trout management plans needs to be carefully defined and understood. (See Appendix C for an informal concept paper prepared for a focus group discussion topic, "The role of hatcheries in trout management"). The principal purpose of trout stocking is still to provide angling recreation, but the consideration of potential adverse effects resulting from introducing fish species into waters where they did not originate is receiving greater attention than in the past. This increased awareness of species interactions within the aquatic ecosystem does not diminish the value of hatchery trout or their importance as a fishery management tool. Instead, it means that fishery managers need to be more careful in how they utilize hatchery trout.

The ecosystem management concept requires a shift in thinking regarding fishery how management is integrated with management of other aquatic organisms. Fishery managers must assess the aquatic environment and consider the consequences, along with the benefits, of introducing or maintaining fish in a specific water. Fishery managers should continue to evaluate the best scientific information available to make wise choices in the use of hatchery products. The use of hatchery trout has created and supported fisheries for California anglers for decades; a practice we want to continue. However, hatchery trout should only be stocked for sound biological and recreational reasons in the appropriate locations.

The CDFG recognizes the need to evaluate all of its trout programs collectively and broaden its scope of aquatic ecosystem management to include a heightened recognition of interactions between trout and other aquatic species. To accomplish a review of CDFG trout management programs, strategic planning was chosen as the process that could best: 1) involve and communicate with a large number of stakeholders, 2) provide insight from different perspectives, 3) identify and address significant issues concerning trout resources and recreational fisheries, 4) develop strategies to meet future challenges, and 5) provide a process with the flexibility to incorporate new information and changing preferences. The CDFG recognizes its responsibilities to comply with CEQA for those new trout management programs that may have significant environmental effects.

CURRENT TROUT MANAGEMENT

Fishery management techniques: Presently, trout fishery management in California is accomplished using one of the three following techniques:

1. Self-Sustaining Fisheries. This management technique is applied to most of the trout waters in the state. Self-sustaining trout populations consist of naturally spawning wild trout that do not need or require hatchery supplementation. Angler harvest in most of these waters is regulated by the general trout daily bag and possession limits. Some highly used, self-sustaining fisheries require more restrictive harvest limitations and special gear regulations to ensure that they remain self-sustaining, and/or maintain high quality fishing in terms of numbers or sizes of fish caught per hour. Self-sustaining fisheries generally require a viable aquatic ecosystem where trout reproduction, growth, and survival are adequate to perpetuate the population, and only habitat protection management strategies are required, in addition to angling regulations. This technique is the preferred type of trout fishery management, and is the most widely used.

2. Put-and-Grow Fisheries. These fisheries are supported by hatchery-produced trout stocked at about 3 to 6 inches in length. This technique is used in waters where spawning habitat is limited and unable to support a satisfactory sport fishery, but fish habitat otherwise supports suitable trout growth and survival. Many of these fish are expected to increase substantially in size and survive for more than one season, thereby providing large, trophy-sized fish or many pan-sized fish in subsequent years.

This management technique is used for aerial stocking of selected high mountain lakes and for inland (non-anadromous) salmon fisheries. Stocking or transplanting genetically pure hatchery fingerlings from nearby wild native trout populations is also a management technique used to re-establish specific strains of native or wild trout into restored habitat.

3. Put-and-Take Fisheries. This management technique is employed to create trout fisheries where they would not naturally exist, or to maintain fisheries where natural production is inadequate to support fishing demand. It is supported chiefly by hatchery-produced trout weighing about one-half pound each and measuring about 10 to12 inches in length. Catchable-sized trout are placed in waters that are easily accessible to the general public and where angling demand is high. Catchable-sized trout are stocked in about 780 (4%) of the 18,000 stream miles and about 300 (8%) of the 3,581 cold water lakes and reservoirs suitable for resident trout in California. Of the 3.5 to 4 million pounds of catchable-sized trout produced each year, approximately 75 percent are stocked into lakes and reservoirs, and 25 percent are stocked into rivers and streams (Appendix D). According to Fish and Game Commission (FGC) policy, “catchable-sized” trout are to be stocked in waters where at least 50 percent will be caught by anglers.

Trout management programs: Trout resources and trout fisheries are currently being managed by the CDFG under the direction of one or more of the following statewide programs:

1. Threatened Native Trout Management. The primary objective of this program is to protect or restore the State’s native species of trout. Three native trout species are currently federally listed as threatened while all others are considered unique or species of

special concern. One native species, the bull trout, no longer exists in California. Restoration efforts often involve managing small, remnant populations and, when necessary, re-establishing populations into historic ranges. Some threatened native trout populations are included in the Wild Trout Program and regulated as catch-and-release fisheries.

2 Heritage Trout Program. In 1998 the FGC established a statewide Heritage Trout Program to enhance the recognition and appreciation of California's native trout populations in their historic habitats. Heritage Trout waters are included in the WildTrout Program policy guidelines and specifically designated as unique native trout waters (Appendix E). A key feature of the program is public education and outreach concerning native trout conservation and restoration. In addition, anglers are provided more opportunities to select unique native trout waters and fish for and observe these native trout. Presently, 4 stream segments totaling 170 miles, and 2 lakes have been designated as heritage trout waters (Appendix F).

3. Wild Trout Program. Management guidelines for wild trout waters are contained in policies established by the FGC (Appendix E). They state, "designated wild trout waters should provide a quality experience by providing the angler with an opportunity to fish in aesthetically pleasing and environmentally productive waters with trout populations whose numbers or sizes are largely unaffected by the angling process". Hatchery-produced strains of wild or semi-wild trout may be used to supplement populations, if necessary, but no stocking of domesticated strains of catchable-sized trout is allowed. Designated wild trout waters must be accessible to the general public and are managed principally by protecting, maintaining, and rehabilitating habitat, and adopting appropriate angling regulations. Presently throughout the State, 33 stream segments totaling approximately 844 miles and three lakes comprising 81 surface acres are managed as designated wild trout waters (Appendix F).

4. Catch-and-Release Fisheries. The CDFG is mandated by Fish and Game Code sections 1725-1728, also known as the Trout and Steelhead Conservation and Management Planning Act, to recommend to the FGC 25 miles of stream and one lake per year for designation as Catch-and-Release waters. The Wild Trout Program coordinates and monitors this mandate. Catch-and-release regulation is employed in waters where trout production and fishing quality is improved by limiting harvest. California practices a modified form of catch-and-release management that encourages zero harvest of trout in designated catch-and-release waters; however, regulations may be established which allow for a daily bag limit of zero, one, or two trout in these waters. Gear is generally restricted to artificial lures with barbless hooks. Catch-and-release is often employed as a management tool in put-and-grow and wild trout managed fisheries. Presently, 41 stream segments totaling about 458 miles, and 19 lakes comprising 6,929 surface acres are designated as Catch-and-Release Waters (Appendix F).

5. Urban Fishing Program. The Urban Fishing Program, which was started in 1993, currently serves Californians living in the Sacramento, San Francisco, Los Angeles, Riverside and the Fresno metropolitan areas. The program's Fishing in the City clinics give citizens in these areas an opportunity to learn how to fish, receive information and education about maintaining healthy aquatic ecosystems, and fish close to home. It also gives participants an opportunity to borrow fishing rods, reels, bait, and tackle through the

Tackle Loaner Program. Ponds are stocked with catchable-sized rainbow trout in winter and catfish during the rest of the year.

6. Hatchery Trout. Trout are produced in state operated hatcheries for the primary purpose of creating angling recreation. Approximately 7 to 8 million catchable-sized trout (one-half pound each, 10-12 inches in length) are produced and distributed annually for catchable trout fisheries. Approximately 75 percent are stocked in lakes and reservoirs, and 25 percent in rivers and streams. An additional 7 million fingerling trout, three to six inches in length, are produced and distributed annually for put-and-grow fisheries, principally in lakes and reservoirs.

7. Hatchery System. Fourteen inland trout hatcheries and facilities throughout the State produce over 16 million trout weighing slightly over 4 million pounds. The average age of the State=s trout hatcheries is about 45 years. The newest facility was completed in 1968 (American River Hatchery in Sacramento County) and the oldest is over 100 years old (Mt. Shasta Hatchery in Siskiyou County). In addition, a Fish Health Program, consisting of five fish pathologists, provides disease prevention, diagnostic, and treatment advice for all hatchery programs.

8. Inland Salmon Program. In addition to trout, California anglers have the opportunity to enjoy fishing for kokanee and chinook salmon in lakes and reservoirs. Salmon are managed as put-and-grow fisheries where they are capable of utilizing food resources more efficiently than trout. The kokanee salmon, a landlocked subspecies of sockeye salmon, is presently stocked in approximately 17 lakes and reservoirs (Appendix G). Approximately 1.5 million kokanee, 3 to 4 inches in length, are planted each year. Typically, they reach a size of 12 to 16 inches by their second year. Chinook salmon are native to California and up to 500,000 are presently planted in several reservoirs in northern California each year (Appendix G). Most chinook are planted as yearlings (about 6 inches long) and typically attain a size of about 14 to 18 inches (2 to 2.5 pounds) by the end of their second year. Most inland salmon are caught by boat anglers trolling lures or bait, but many are caught from shore during cooler weather.

Existing policies and guidelines: Overall direction for CDFG=s trout resource and fishery management programs is provided by various FGC policies (Appendix E).

Trout Policy. This policy states that natural reproduction and rearing of trout will be encouraged by protecting and improving habitat and by affording protection from disease, predators, and competing fish species. It emphasizes managing for self-sustaining wild trout populations. Hatchery trout are to be used only when necessary and in waters where they do not compete or hybridize with trout which are threatened, endangered, or species of special concern. This policy also contains guidelines for use of catchable-sized trout in waters where the expected harvest rate is at least 50 percent.

Golden Trout Policy. This policy recognizes the golden trout as the State Fish and designates certain waters as AGolden Trout Waters of California@. It specifies that golden trout will be protected and perpetuated within its historic range and in other suitable waters. Rainbow trout and other species of trout are not to be planted in designated golden trout waters. The Golden Trout Policy prevails over the Trout Policy if the two are in conflict.

Wild Trout Policy. This policy establishes a Wild Trout Program and designates specific waters to be managed exclusively for wild trout (Appendix F). Designated wild trout waters should provide a quality experience by providing the angler with an opportunity to fish in aesthetically pleasing and environmentally productive waters with trout populations whose numbers or sizes are largely unaffected by the angling process. Habitat protection is of utmost importance for maintenance of wild trout populations. Included in this policy is the recognition of certain waters as Heritage Trout waters.

Trout management in California is also guided by various legislative acts as reflected in the Fish and Game Code, Public Resources Code, and Water Code. Some of the pertinent code sections which affect trout management are:

Fish and Game Code Sections

1600-1607	Lake and Streambed Alteration
1725-1728	Trout and Steelhead Conservation and Management Planning Act of 1979
2050-2116	California Endangered Species Act
5650-5652	Discharge of Pollutants into Water
5653-5653.9	Suction dredging
5937	Sufficient water for fish existing below dams
5980-6028	Fish Screens on Diversions

Public Resources Code Sections

10000-10005	Minimum Streamflow Requirements
21000 et seq.	California Environmental Quality Act (CEQA)

Water Code Sections

1243	CDFG to be notified of application to appropriate water
1257	Considerations regarding appropriation of water
3930	Mining pollution
13000 et seq.	Water pollution

GOALS AND STRATEGIES FOR THE FUTURE

The goals and strategies presented in this plan have been developed around two themes that reflect the general mission of CDFG: 1) Habitat and native species protection and management, and 2) recreational angling. Critical to the development of this plan and its subsequent implementation are the overarching themes of communication and education, which are intertwined throughout the two primary themes. The goals and strategies associated with each theme are not prioritized, but protecting and maintaining habitat, and ensuring that native species populations are not jeopardized, must take priority over recreational angling considerations, if conflicts occur.

THEME I: HABITAT AND NATIVE SPECIES PROTECTION AND MANAGEMENT

ISSUE 1: Protection and Restoration of Aquatic Habitats.

Habitat related issues are generally considered the key factors causing declines of species throughout the United States. Trout habitat in California has been adversely affected for decades by population growth, land-use practices, water diversions, and land development. While past problems have been recognized, and in some cases corrective measures taken, adverse impacts continue to persist. Restoration or enhancement of habitat degraded from past land-use practices is an important issue today, but will be even more vital as an increasing population places more demands upon the State's natural resources. California had an estimated population of 34.8 million at the beginning of 2001. By the year 2010, the projected population in California will be nearly 40.2 million, a 15 percent increase. Even with prudent planning, a population increase of this magnitude will place additional burdens and demands on natural resource agencies and all natural resources, especially water. Maintaining self-sustaining trout populations will require protecting or minimizing adverse effects on trout habitat within watersheds affected by additional urban or residential land development, timber harvest, or agricultural uses.

Preserving habitat is more effective than trying to restore it after it is damaged. Protecting habitat requires knowledge of natural physical and biological interactions within a watershed, and how human manipulation of resources (including industrial, domestic, and recreational uses) affects the watershed's natural physical and biological features. Landowners and land managers need to know what effects their activities have upon the watershed and the range of options available to eliminate or reduce those impacts. Watershed groups, made up of people living and working within a watershed, are an effective forum for communication, education, and demonstration of principles that allow resource use and enjoyment, while maintaining a functional ecosystem.

A role of CDFG when participating within watershed groups is to provide encouragement, technical support, and scientific information in the pursuit of healthy ecosystems. Fostering natural resource stewardship principles among public and private landowners, and land managers is an important role for the CDFG, but the landowner plays the key role in being responsible for maintaining and perpetuating the resources under his/her care.

The CDFG also plays another role in habitat protection by enforcing regulations that are designed to prevent habitat degradation, or by using legal means to ensure the implementation of

mitigation or habitat restoration activities. The regulatory role is the final means available to persuade entities or individuals to reduce adverse habitat impacts.

The Department, landowners, land managers, and resource users must work together to protect and enhance existing trout habitat, so that natural sustaining trout populations will be maintained as more demands are placed upon natural resources throughout the State.

GOAL 1.1 USE AN ECOSYSTEM APPROACH TO TROUT RESOURCE MANAGEMENT.

Strategy 1.1.1 Define ecosystem management boundaries within each Region. The California Watershed Map (CalWater 2.2) [5/] , Hydrologic Area level, is proposed as the basis for these delineations, but actual management areas may depend upon other factors (Appendix H).

Strategy 1.1.2 Develop a consistent approach for ecosystem management plans that includes basic information required, standardized data recording forms, and a hierarchal system for prioritizing action items.

Strategy 1.1.3 Develop trout management action plans for each watershed or ecosystem management unit identified in Strategy 1.1.1. Activities to be accomplished within each watershed unit will be based on defined time intervals. Progress reports at specified intervals will measure and evaluate success of objectives and activities.

Strategy 1.1.4 Integrate trout habitat management with other resource management and land-use practices occurring within an ecosystem management area (e.g., participate in Natural Community Conservation Planning (NCCP), Habitat Conservation Plans, Federal Energy Regulatory Commission relicensing processes, and Coordinated Resource Management and Planning (CRMP) groups when and where appropriate).

GOAL 1.2. PROTECT AND RESTORE AQUATIC ECOSYSTEMS

Strategy 1.2.1 Develop and maintain an assessment system of native and wild trout populations and habitat conditions. Use assessment data to identify and prioritize where protection and restoration efforts are needed most.

Strategy 1.2.2 Protect and maintain natural biological diversity (biodiversity) within the aquatic ecosystem. Management plans will consider native species relationships within the aquatic community and will strive to maintain the natural biological and physical diversity, and species dynamics.

Strategy 1.2.3 Develop training and resource assessment protocols to assist fishery biologists and managers in recognizing and maintaining appropriate aquatic biodiversity.

Strategy 1.2.4 Develop an aquatic genetics program that conducts genetic investigations to describe native stocks, establishes a genetic reference collection, identifies introgressed or hybridized populations, and includes a genetic monitoring program that advises managers and biologists about genetic status and trends of native trout populations.

Strategy 1.2.5 Encourage development of opportunities that could provide additional revenue or incentive for trout resource protection and restoration among the private sector.

Strategy 1.2.6 Increase collaborative efforts with other agencies and watershed restoration groups (e.g., CRMPs) to protect aquatic ecosystems and ensure maintenance of adequate streamflows for trout.

Strategy 1.2.7 Protect and improve aquatic habitats through acquisition of lands, water rights, and conservation easements.

Strategy 1.2.8 Support research activities that increase the knowledge of species interactions, restoration techniques, resource assessment methods, and management strategies.

GOAL 1.3 IMPROVE COMMUNICATION WITH ALL TROUT RELATED AQUATIC ECOSYSTEM STAKEHOLDERS

Strategy 1.3.1 Increase the amount of information available both on the Internet and in printed material that promotes a heightened awareness of the value of aquatic resources, and that encourages the practice of natural resource conservation.

Strategy 1.3.2 Promote resource stewardship by developing "how-to"guidance material and possible incentives for landowners and land managers to use resource friendly practices, and by identifying examples of successful resource stewardship employed by landowners and land managers within similar landscapes that could act as models for others to follow or improve upon.

Strategy 1.3.3 Collaborate with schools and educators to develop training and educational materials that promote the principles of natural resource conservation and stewardship, and the value of natural habitats.

THEME II: RECREATIONAL ANGLING

In the interest of developing themes that are consistent with CDFG's dual mission, recreational angling has been identified as a separate theme. However, one should recognize that the management of angling activity is an element of the broader sphere of fisheries management, which includes protecting and maintaining native and wild species, and their habitats.

ISSUE 2. AVAILABILITY OF DIVERSE ANGLING OPPORTUNITIES

Trout anglers form a diverse group with a broad spectrum of experience, skill, available leisure time, financial means, and angling desires. However, even with a broad array of diversity, trout anglers share common goals. Most are seeking a pleasant recreational experience, a chance to get outdoors in pleasant surroundings, an opportunity to share a fishing experience with family and friends, and a good chance of catching a fish.

Providing angling opportunities to a diverse angling community throughout the State requires knowledge of what various anglers value in an angling experience, and how they are represented in the angling population. The most recent angler survey in California was conducted in 1988 [6/]. In order to properly address satisfying angler opportunities, we need to update and improve our knowledge of the experiences the angling communities are seeking.

We also are challenged to provide angling diversity by satisfying demands for wild trout fisheries and hatchery-supported fisheries. During recent years, determining angler demand for various types of fisheries has been mostly based on professional judgment. For example, we do not have up-to-date information regarding the percentage of anglers preferring wild trout fisheries or catch-and-release (limited harvest) fisheries, or the percentage of anglers targeting hatchery supported fisheries, or the proportion of anglers that have no specific preference; they just want to catch fish.

Current knowledge of angler use and demand is particularly important for establishing production goals in our hatcheries. The CDFG and its constituents want hatcheries to be operated in an efficient manner with the amount of fish produced consistent with the degree of angling demand. The effectiveness and efficiency with which hatcheries meet recreational needs can only be measured and evaluated if angler use and satisfaction surveys are conducted at regular intervals. The CDFG needs to find additional personnel resources and operating funds to conduct a meaningful monitoring and evaluation program for all of its fisheries.

The issue of allocation of resources is one of balancing demands for various types of trout fisheries while considering the needs of individual fish populations. The status of a trout population that includes the entire suite of population dynamic components (e.g., reproduction, age and growth, survival, recruitment of young to adult, sustainable harvest yield, and current harvest rate) should be the principal item that determines angling regulations for self-sustaining trout fisheries. Other considerations that can shape fishery regulations include angler preferences, social values, and economics.

6/ Fletcher, J. E. and M. King. 1988. Attitudes and preferences of inland anglers in the State of California. Final report to California Department of Fish and Game, Sacramento.

Fishing is an emotional experience that is personal and different for each individual. Our mission is to provide as much diversity as possible that allows anglers to discover and enjoy a satisfying and rewarding angling experience. This should not be interpreted as a guarantee for a limit of trout. Rather it is a mission to maintain trout populations in as many acceptable locations as possible, and use angling regulations and supplemental stocking when appropriate, to provide anglers with a reasonable chance of hooking a trout in a wide variety of environments. The challenge for future trout managers will be to identify the levels of different angling desires within the angling population and provide commensurate levels of angling opportunity.

Another issue that stems from many anglers, and apparently a large segment of the general public, is the perception that all situations resulting in poor angling or reduced trout populations can be solved by stocking hatchery fish. If a naturally reproducing trout population is not supporting satisfactory angling, the first step for the fishery manager is to determine the reasons why. Supplementing naturally reproducing populations with the appropriate hatchery-reared fish should be justified when other factors for the population=s decline have been evaluated and addressed.

The majority of trout produced in CDFG hatcheries are for creating or enhancing recreational angling, which is in contrast to most anadromous fish hatcheries where salmon and steelhead are produced to mitigate for lost habitat upstream of dams. In general, hatchery trout do not solve resource or habitat problems; hatchery trout create recreational opportunities. Trout resources are restored by rehabilitating habitat, providing adequate stream flow regimes, and maintaining conditions suitable for trout reproduction and growth within the aquatic ecosystem. However, hatchery trout play an important role in providing fishing opportunity for millions of California=s anglers, and visitors from other states and countries. In fact, many communities depend heavily upon fisheries supported with hatchery trout. The challenge is to use these fish prudently, in the proper environments.

The issue regarding the role of hatchery fish in California has been intertwined among several issues and concepts considered throughout the development of this strategic plan. A discussion paper entitled "*Role of Hatchery Reared Trout in California*" (Appendix C) was prepared at the request of a focus group assisting in this plan's development. This paper concluded that ". . . development of future strategies for utilizing hatchery trout in California's trout fisheries should include: a) public education regarding the purpose of hatchery-produced trout, b) a systematic program of monitoring and evaluating stocked waters, and c) increased awareness among trout managers, and the public, regarding the effects of trout stocking on the natural biodiversity and species interactions within the aquatic ecosystem".

GOAL 2.1. PROVIDE, MAINTAIN AND ENHANCE DIVERSE TROUT ANGLING OPPORTUNITIES THROUGHOUT THE STATE.

Strategy 2.1.1 Develop a stream and lake classification system that identifies management strategies for various waters within ecosystems. An example model is presented in Appendix I.

Strategy 2.1.2 Develop and implement at regular intervals (e.g., every 5 years) a statewide survey to determine angler preferences, attitudes and satisfaction regarding trout fishing in California.

Strategy 2.1.3 Increase emphasis on wild, self-sustaining trout fisheries as the preferred and most efficient management strategy according to current policy.

Strategy 2.1.4 Promote the value and appropriate use of hatchery-produced, catchable-sized trout fisheries for providing a recreational experience to many anglers who would not otherwise have the opportunity.

Strategy 2.1.5 Identify additional waters within 50 miles of major urban areas suitable for high yield, put-and-take management.

Strategy 2.1.6 Develop a program for training and utilizing volunteer anglers for collecting and recording standardized information about the fisheries they use, especially those in remote locations.

Strategy 2.1.7 Maintain and improve angler access to trout fishing waters through acquisition of lands and easements, and construction and maintenance of boat ramps, parking lots, restrooms, and facilities for physically challenged persons.

GOAL 2.2. IMPROVE THE EFFECTIVENESS AND EFFICIENCY OF HOW HATCHERY TROUT ARE UTILIZED FOR PROVIDING ANGLING OPPORTUNITIES.

Strategy 2.2.1 Develop improved criteria for measuring the success and effectiveness of stocking trout in specific waters that includes the harvest of trout stocked and the number of angler-days generated.

Strategy 2.2.2 Develop a systematic monitoring and evaluation plan to survey angler use, angler catch, fish population status, and overall effectiveness of management strategies in individual waters.

Strategy 2.2.3 Re-evaluate stocking locations, and the number and frequency of trout stocked based on criteria developed in Strategies 2.2.1 and 2.2.2.

Strategy 2.2.4 Base hatchery production levels on angler demand and effectiveness of hatchery products at creating recreational angling opportunities. This strategy is dependent upon information and evaluations generated from Strategies 2.2.1 through 2.2.3.

Strategy 2.2.5 Investigate the feasibility of obtaining or creating sterile (triploid) trout and salmon for stocking in specific high-use waters where hybridization with wild native fish may be an issue.

GOAL 2.3 INCREASE THE GENERAL PUBLIC'S UNDERSTANDING AND APPRECIATION FOR THE STATE'S TROUT RESOURCES AND ASSOCIATED RECREATIONAL OPPORTUNITIES THROUGH IMPROVED COMMUNICATION AND EDUCATIONAL SOURCES.

Strategy 2.3.1 Improve the current supply of informational brochures, leaflets, videos, and internet web pages pertaining to trout and related aquatic resources, angling opportunities, and conservation, and restoration activities.

Strategy 2.3.2 Investigate and implement various techniques to improve the clarity of angling regulations.

Strategy 2.3.3 Simplify existing trout regulations by reducing the number of regulations while maintaining management objectives.

Strategy 2.3.4 Develop partnerships with fishing organizations and tackle manufacturers and distributors for producing and distributing informational material regarding recreational angling opportunities and resource conservation.

Strategy 2.3.5 Take advantage of the public's fascination with observing live fish by increasing the importance and utility of hatchery-related facilities as centers of information and education. For example, develop aquariums and displays at selected hatchery facilities that inform the public about the various species within local aquatic ecosystems.

THE NEXT STEP

This Strategic Plan identifies some changes in direction for trout management that include a broader view and appreciation of the entire aquatic ecosystem. It includes strategies to improve and update trout resource status and recreational use information, strategies for using hatchery-produced trout more efficiently, and strategies for integrating educational opportunities to improve the general public's interest and understanding of trout related resources.

The next step in the strategic planning process is the development of an implementation plan that will describe specific objectives and actions planned for trout management statewide, and within each watershed management unit containing resident trout populations or native trout habitat. One of the initial steps in developing the implementation plan will be to ensure that all new trout management activities performed by CDFG meet CEQA requirements.

Implementation plans will include monitoring, evaluation, and reporting schedules that are consistent and relevant to the types of actions implemented.

Employing the concepts and guidelines established in this strategic plan, the implementation planning phase will describe actions to accomplish the following:

1. Determine the appropriate level of environmental impact disclosure documentation required by CEQA for each new major trout management program, and prepare the necessary CEQA documents.

2. Confirm or define watershed management units for trout managers. The proposed watershed delineation model is based on the California Watershed Map (version 2.2) at the Hydrologic Unit and Hydrologic Area levels.

3. Determine presence and range of all resident trout and salmon, and other important aquatic species within each watershed unit. This information will be available for GIS- generated map displays and analysis for each stream or lake where trout occur.

4. Classify appropriate trout management in all streams and lakes within each watershed based on the management classification system similar to that defined in Appendix J. This information also will be available for GIS-generated map displays and analysis for each stream or lake providing trout habitat or trout fisheries.

5. Identify existing management plans and activities currently taking place or planned in the near future, for each management unit, and integrate these into planned actions.

6. Develop a reporting template for trout management plans that include baseline resource assessment requirements and a priority system for implementing actions.

7. Identify key items pertaining to trout management within each watershed management unit that will require timely action or coordination with other agencies.

8. Develop additional statewide actions designed to implement strategies set forth in this strategic plan.

Specific activities identified, including preliminary cost estimates, will be prioritized based on benefit and need. Additional funding may be required to pursue many of the strategies described in this plan. This strategic and subsequent implementation plans may be used in concert to identify and justify the funding required to accomplish specific actions.

APPENDIX A

Fishery Management Plans

Completed:

American River, North Fork
Bear Creek (San Bernardino County) - 1989 Addendum Update - 1993
Carson River, East Fork (Alpine County) - 1979
Clavey River Habitat (Tuolumne County) - 1985
Cottonwood Creek (Inyo County) - 1985
Crowley Lake (includes Upper Owens River and other tribs)(Mono County) - 1997
Deep Creek (San Bernardino County) - 1983
Fall River (Shasta County) - 1986
Hat Creek, Lower (Shasta County) - 1975, Updated Plan 1999
Kern River, Upper (Kern and Tulare counties) - 1995
Kings River, South Fork (Fresno County) - 1982
Mammoth Lakes Basin and Adjacent Waters (Mono, Madera, and Fresno counties) - 1989
Merced River, South Fork (Mariposa County) - 1979
Nelson Creek (Plumas County) - 1979
Owens River, Lower (Inyo County) - 1997
Rubicon River (Placer County) - 1979
Sacramento River, Upper (Shasta and Siskiyou counties)(Final July 2000)
Sespe Creek (Ventura County) - 1986
Yellow Creek, Canyon (Plumas County) - 1981

Draft Plans Completed

Feather River, Middle Fork (Plumas County)
Hot Creek (Mono County)
Kings River, Upper (Fresno County)
Klamath River, Upper (Siskiyou County)
Manzanita Lake (Shasta County)
McCloud River (Shasta County)
Stanislaus River, Middle Fork (Tuolumne County)
Stone Lagoon (Humboldt County)

APPENDIX B

Resident trout and salmon in California

Common Name	Scientific Name
Native	
Coastal rainbow	*Oncorhynchus mykiss*
Steelhead (anadromous form)	
Eagle Lake rainbow	*O. m. aquilarum*
Kern River rainbow	*O. m. gilberti*
Coastal cutthroat	*O. clarki clarki*
Sea-run cutthroat trout (anadromous form)	
Lahontan cutthroat	*O. c. henshawi* [1/]
Paiute cutthroat	*O. c. seleniris* [1/]
California golden	*O. mykiss. aquabonita*
Little Kern golden	*O. m. whitei* [1/]
McCloud River redband	*O. m. subspecies* [2/]
Goose Lake redband	*O. m. subspecies* [2/]
Warner Valley redband	*O. m. subspecies* [2/]
Bull trout (Dolly Varden)	*Salvelinus confluentus* [3/]
Chinook salmon	*Oncorhynchus tshawytshca*
Non-native	
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Lake trout	*Salvelinus namaycush*
Kokanee salmon	*Oncorhynchus nerka*

1/ Federally listed as Threatened.
2/ Taxonomic status not described by the taxonomic community.
3/ Believed to be extinct in California.

APPENDIX C

Role of Hatchery Reared Trout in California

(Developed for discussion by strategic planning focus group)

Trout culture has been a part of California's history almost since statehood in 1850. The culture of trout in a public owned hatchery and the distribution of trout into waters throughout the State began in California in 1870, and at least one private hatchery was in existence prior to this date [1/]. The prevailing management philosophy during the late 1800's and early 1900's was to augment California's trout streams and lakes with cultured fry and fingerling trout, and to introduce trout into other suitable waters where trout did not occur naturally. In its first biennial report to the Governor, the Commissioners [2/] stated their mission as ". . . members of the Board (serve for) the satisfaction of doing something towards the preservation of the fish in our waters and adding to the food supply of the people by the introduction of new varieties (species) . . ." [3/]. During these early years many people depended on the harvest of trout for subsistence, and it is clear that one of the chief roles of early fish culture in California (and probably most other states) was to augment the food supply for the people of the State. Since World War II, the principal role of State operated fish hatcheries has been to provide recreational angling opportunities.

The purpose of the following discussion is to clarify and define the modern role of hatchery-produced trout in California with regard to overall trout management. As we embark on the development of a statewide strategic plan for the future management of trout resources in California, the wise and efficient use of various hatchery products is central to many management strategies. The California Department of Fish and Game (CDFG) has been criticized by various individuals and groups, from both sides of the anti- and pro-hatchery spectrum, on how it uses the trout hatchery products. Now it seems appropriate to pause and consider the important aspects of our trout hatcheries, including over 125 years of learning experiences, new scientific evidence regarding fish genetics, changing angler attitudes and philosophies, and fiscal priorities. We must address the question, "What should be the role of hatchery-produced trout in California's trout resource management programs?".

Hatcheries play a major role in providing recreational trout angling in California. Hatchery products are used in varying degrees in many trout management strategies implemented by the CDFG. The majority (90-95%) of the pounds of fish produced consist of one-half-pound trout for put-and-take (catchable) fisheries. Fingerlings and sub-catchables for put-and-grow fisheries, and native trout for enhancing threatened populations comprise the remaining hatchery production poundage.

1/ E. Leitritz. 1970. A history of California's fish hatcheries, 1870-1960. Calif. Dept. of Fish and Game, Fish Bulletin 150.

2/ The California State Legislature formally initiated trout resource management in 1870 when it appointed the three-member Board of Commissioners of Fisheries. This board governed resource management until 1927 when the Department of Natural Resources was created along with a Division of Fish and Game. A new Fish and Game Commission was also created to administer the Division.

3/ _____. 1933. Report of Commissioners of Fisheries of the State of California for the years 1870 and 1871. Calif. Fish and Game, 19(1): 41-56.

APPENDIX C (continued)
Role of Hatchery Reared Trout in California

The catchable product is the most well known to the general public, is very popular among anglers, but also is the cause for considerable controversy. The principal issues or concerns regarding the role of hatchery trout in California include:

1. The catchable program has created a dependency or unrealistic expectation among many anglers for catching a limit of trout on every fishing trip.

2. The catchable program promotes consumption instead of resource appreciation.

3. Hatchery fish might transmit diseases to wild trout populations.

4. Fish introduced into historically fishless waters may contribute to the loss of natural biological diversity (biodiversity).

5. There is a potential for adverse genetic interactions between wild and/or native trout and cultured trout.

6. Catchable trout are not being used effectively to benefit the maximum number of anglers.

7. Catch-rates and angler success are not being monitored and evaluated in most waters stocked with hatchery trout.

8. The hatchery program is allotted a disproportionately large amount of funds relative to other trout resource programs (e.g., wild or native trout).

None of these issues or criticisms suggest eliminating hatcheries from the trout management equation, but they express concerns about how the hatchery product has been used and promoted. These issues also demand that we consider more carefully the scope of interactions between hatchery trout and native fish and other aquatic species within aquatic ecosystems.

As noted before, the principal role of hatchery-reared trout in CDFG trout management is to provide recreational angling opportunities. Angling opportunities are enhanced by placing catchable-size trout into waters where: 1) access is near a road and convenient, 2) angling pressure is high, 3) anglers want to keep some of their catch, and 4) natural reproduction does not occur or is not sufficient to support the harvest demand. Also, juvenile or sub-catchable size trout are placed in waters where trout populations currently exist, but where limited reproductive habitat prevents the population from being self-sustaining.

APPENDIX C (continued)
Role of Hatchery Reared Trout in California

Hatchery reared trout are generally not produced to provide direct benefits to self-sustaining populations. The exception is the culture of juveniles originating from wild, native trout that are in danger of being extirpated, or the rearing of wild native trout strains for re-introduction back into their historic range. While most hatchery-produced trout are consumed by anglers, supplementing the State's food supply has not been an explicit goal of hatchery trout production since the 1930's.

Also, the mission of the CDFG is to " manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and their use and enjoyment by the public". While the production of trout helps the CDFG meet the second part of its mission, to provide for the use and enjoyment of resources, such activities must also be consistent with the CDFG's role to protect and maintain native species and their habitats. In this regard, the use of hatchery trout should be guided by the goal of preventing or minimizing adverse effects to native trout species, and more generally, minimizing adverse effects to the natural biodiversity of aquatic communities.

With these considerations in mind, guidelines for the use of hatchery trout by fishery managers should be reviewed and updated, and address the following topics:

1. Review of all existing waters that are stocked with catchable trout and development of planting priorities based on providing maximum angler use. This may require eliminating lightly used and/or more remote waters. It also may require increasing planting frequency in heavily used waters.

2. Development of a policy requiring systematic evaluations of waters stocked with hatchery trout to determine angler use, angler catch, survival of stocked fish, age structure of the trout population, and environmental impacts. This may require redirection of existing funds or development and funding of a new program.

3. Development of a stream and lake classification system that designates the type of fishery management strategies appropriate for each stream reach or lake/reservoir within a designated watershed. A system of this type would identify specific waters where hatchery products should or should not be used.

Implicit in several of these guidelines is a policy of systematically monitoring waters where hatchery fish are used. Currently the success of the Department's hatchery program has been described in terms of the quantity of trout produced. For many years CDFG biologists have not had the resources to monitor the number of angler days generated or trout caught in hatchery-stocked waters throughout the State. Monitoring harvest, survival, and growth of stocked fish should be used to implement a policy founded on fundamental fishery management principles, good business practices, and common sense. In this regard, biologist positions should be developed to coordinate angler surveys and other resource assessment investigations of waters

APPENDIX C (continued)
Role of Hatchery Reared Trout in California

where hatchery trout are used. These biologist positions would be in addition to existing district or regional fishery biologist positions. The evaluation of the hatchery system would thus be based on survey data measuring the effectiveness of the hatchery-produced trout at providing angling recreation.

Future trout management programs should also recognize the valuable educational potential of our hatcheries and fish products they produce. By effectively utilizing the high public interest, towards the live fish that are easily visible in our hatcheries, and increasing the opportunities for the public to appreciate the value and enjoyment of recreational angling, the CDFG has the potential to stimulate interest in learning about natural resource-related issues.

In summary, development of future strategies for utilizing hatchery trout in California's trout fisheries should include: a) public education and awareness regarding the purpose of hatchery-produced trout, b) increased awareness among trout managers and the public on the potential adverse effects of trout stocking on natural biodiversity and species interactions within the aquatic ecosystem, and c) a systematic program of monitoring and evaluating stocked waters.

Prepared by: James Hopelain, Fisheries Programs Branch (11/16/98)

APPENDIX D

Catchable trout plants in streams vs lakes/reservoirs
Based on 2002 stocking allotments
Numbers represent pounds of fish

Region		I		II		III		IV		V		VI		TOTAL	
		lbs	%	lbs	%	lbs 3/	%	lbs	%	lbs	%	lbs	%	lbs	%
Lake or Reservoir	RT 1/	312,525		375,435		441,600		413,800		386,300		660,700		2,590,360	
	Other 2/	37,700		80,500		0		4,000		0		0		122,200	
	Subtotal	350,225	74.9%	455,935	86.4%	441,600	96.8%	417,800	61.4%	386,300	90.4%	660,700	63.0%	2,712,560	75.2%
Stream	RT 1/	99,620		66,400		14,750		260,700		40,800		388,400		870,670	
	Other 2/	17,700		5,325		0		1,000		0		0		24,025	
	Subtotal	117,320	25.1%	71,725	13.6%	14,750	3.2%	261,700	38.5%	40,800	9.6%	388,400	37.0%	894,695	24.8%
	TOTAL	467,545		527,660		456,350		679,500		427,100		1,049,100		3,607,255	

1/ Rainbow trout (includes Eagle Lake rainbow trout).
2/ Includes cutthroat, brook and brown trout.
3/ Data for Region 3 represents actual fish stocked in 2001.

Notes: Region I currently referred to as the Northern CA and North Coast Region
Region II currently referred to as the Sacramento Valley and Central Sierra Region
Region III currently referred to as the Central Coast Region
Region IV currently referred to as the San Joaquin Valley and Southern Sierra Region
Region V currently referred to as the South Coast Region
Region VI currently referred to as the Eastern Sierra and Inland Deserts Region.

RT percent stocked = 95.9%
Other percent stocked = 4.1%

APPENDIX E

Policies adopted by the California Fish and Game Commission relating to trout management

A. Trout Policy.

4. Natural reproduction and rearing of trout will be encouraged to the greatest extent possible by protecting and improving habitat and by affording protection from disease, predators and competing fish species.

2. Populations of wild trout shall be sustained in suitable waters to provide a diversity of angling opportunities.

3. In some waters it may be necessary to restrict angler harvest to the extent that such harvest has virtually no long-term effect on numbers and sizes of fish in the populations.

4. Artificial propagation is a major Department program, but will be utilized only when necessary to augment natural production.

5. Stocking fingerling and subcatchable-sized trout shall take priority over planting catchable-sized trout in the hatchery stocking program when smaller fish will maintain satisfactory fishing.

6. Hatchery trout shall not be stocked in waters where they may compete or hybridize with trout which are threatened, endangered or species of special concern. Exceptions may be made for stocking waters which are not part of a species recovery program.

7. Catchable-sized trout shall be stocked only in lakes, reservoirs and streams where natural production and growth are inadequate to maintain populations capable of supporting fishing.

8. Catchable-sized trout shall be stocked only when it is reasonable to expect at least 50% by number or weight will be taken by anglers.

9. When stocking catchable-sized trout, lakes and larger streams shall have priority over smaller streams.

10. When stocking catchable-sized trout, suitable waters with heavy fishing pressure compared to the size of the planting allotment shall have priority.

APPENDIX E (continued)

Policies adopted by the California Fish and Game Commission relating to trout management

11. When stocking catchable-sized trout, trophy fish, weighing one pound or more, may constitute up to 10% by weight of each load of catchables stocked, if they replace equivalent poundage of catchables in the allotment for the water stocked.

12. Subcatchable-sized trout may be stocked in lakes, reservoirs and streams, where appropriate, to augment trout populations in such waters to increase fishing opportunities and success.

13. Fingerling-sized trout shall be stocked primarily in waters where reproduction is limiting and satisfactory angling can be supported with fingerling stocking, where the population has been destroyed, and in lakes where they will establish a new fishery or augment the existing fishery.

14. Water companies, utility districts and other public or private agencies in control of urban lakes shall be encouraged to finance put-and-take trout fishing in these when suitable. The CDFG will provide technical assistant for developing and maintaining these fishing programs.

A. Golden Trout Policy

1. The golden trout, designated as the state fish of California, will be perpetuated and maintained as appropriate to support its designation.

2. Certain waters within the high mountainous areas of Madera, Fresno, Inyo, Mono and Tulare counties may be designated as "Golden Trout Waters of California".

3. Golden Trout waters shall include, if possible, all native golden trout streams in the above areas, and any other stream or lake in which non-native but self-perpetuating wild golden trout form the bulk of the population.

4. Within these waters golden trout will be preserved and maintained in as genetically pure a state as possible.

5. Rainbow trout and other species of trout shall not be planted in designated golden trout waters.

6. Barren lakes in the golden trout areas may be preserved by the Department for future stocking of golden trout.

APPENDIX E (continued)

Policies adopted by the California Fish and Game Commission relating to trout management.

7. A brood stock shall be maintained in lakes set aside for the sole purpose of egg production to provide fingerlings for planting waters.

8. Hatchery-reared or wild fingerlings may be used for initial stocking in streams and lakes designated by the Department.

9. In lakes containing other fish populations, the golden trout fingerlings will be of such size that a reasonable survival may be expected.

10. Fingerlings may be stocked to maintain populations in lakes.

11. Whenever practicable, the range of golden trout will be extended through wild fish or fingerling plantings in native waters through a recovery plan, or in other waters possessing adequate spawning grounds.

12. The Golden Trout Policy prevails over the Trout Policy if the two are in conflict.

B. Wild Trout Policy

1. Certain waters designated by the FGC shall be managed exclusively for wild trout.

2. Designated wild trout waters should provide a quality experience by providing the angler with an opportunity to fish in aesthetically pleasing and environmentally productive waters with trout populations whose numbers or sizes are largely unaffected by the angling process.

3. Access to designated wild trout waters shall meet the following criteria:
   a. open for public angling with unrestricted access and of sufficient dimensions to accommodate anglers without over crowding.
   b. open for public angling with controlled access under a plan approved by the FGC setting forth the number of anglers and the method of distribution.

4. Designated wild trout waters will be able to support, with appropriate angling regulations, wild trout populations of sufficient magnitude to provide satisfactory trout catches in terms of number or size of fish.

APPENDIX E (continued)

Policies adopted by the California Fish and Game Commission relating to trout management

5. Domestic strains of catchable-sized trout shall not be planted in designated wild trout waters.

6. Hatchery-produced trout of suitable wild or semi-wild strains may be planted in designated waters, but only if necessary to supplement natural trout reproduction.

7. Habitat protection is of utmost importance for maintenance of wild trout populations. All necessary actions, consistent with State law, shall be taken to prevent adverse impact by land or water development projects affecting designated wild trout waters.

8. The Department shall prepare and periodically update a management plan for each water designated as a wild trout water.

9. Certain designated wild trout waters may be further designated as "Heritage Trout Waters", to recognize the beauty, diversity, historical significance, and special values of California's native trout.

10. Heritage Trout Waters will include only those populations that best exemplify indigenous strains of native trout within their historic drainages.

11. Heritage Trout Waters shall be able to provide anglers with the opportunity to catch native trout consistent with conservation of the native trout present.

12. To recognize the importance of native trout to California's natural heritage, the Department shall emphasize education and outreach efforts to inform the public about our native trout, their habitats, and the activities for restoration of native trout.

APPENDIX F

CALIFORNIA DEPARTMENT OF FISH AND GAME
DESIGNATED WILD TROUT AND CATCH-AND-RELEASE WATERS
2001

A listing of streams and lakes that have been designated by the Fish and Game Commission as Wild Trout waters (WT) under the Commission's Policy on Wild Trout and designated Catch-and-Release trout waters (CR) pursuant to the Trout and Steelhead Conservation and Management Planning Act of 1979

KEY

RT = rainbow trout
BN = brown trout
BK = brook trout
CT = cutthroat trout
GT = golden trout

WT = designated Wild Trout water
CR = designated Catch-and-Release Trout water
HT = designated Wild and Heritage Trout water
NF = closed to fishing
SH = steelhead rainbow trout

Location/ Designated Water	Length (miles) or Area (acres)	Trout Species	Program Designation	Bag Limit	Size Limit Min.	Size Limit Max.
Northern California						
Upper Sacramento River [1/]	28 [1/]	RT	CR	0 [1/]		
Upper Klamath River	6.2	RT,BN	WT	5		
McCloud River	5	RT,BN	WT,CR	2		
McCloud River	2.3	RT,BN	WT,CR	0		
Pit River	5	RT	CR	2	18"	
Fall River	23	RT	WT,CR	2		14"
Tule River	9	RT	CR	2		
Hat Creek	3.5	RT,BN	WT,CR	2	18"	
Burney Creek	1	RT,BN,BK	CR	2		14"
Hayfork Creek	24	SH	CR	0		
M.F. Stony Creek	10	RT	CR	2 [2/]		
Big Lake	790	RT	CR	2		
Eastman Lake	60	RT	CR	2		
Grass Valley Creek Reservoir	40	RT	CR	2		
Manzanita Lake	53	RT,BN	CR	0		
Stone Lagoon	570	CT,SH	CR	2,0 [3/]	14"	
Eagle Lake	28,000	RT	HT	2		
Coastal Streams						
M.F. Eel River	28	SH	CR	0		
San Lorenzo River	15	SH	CR	1 [4/]		
Carmel River	12	SH	CR	0		
Big Sur River	6	SH	CR	0		

1/ There are two reaches: 6 miles from Box Canyon Dam downstream to Scarlett Way in Dunsmuir, and 22 miles of the upper Sacramento River from the county bridge at Sweetbriar downstream to Shasta Lake.

2/ Two trout – last Saturday in April through November 15, zero limit November 16 through last Friday in April.
3/ Two-trout limit, 14 inches minimum size for coastal cutthroat trout; steelhead must be released.
4/ One hatchery trout or steelhead; wild steelhead must be released.

APPENDIX F (continued)
CALIFORNIA DEPARTMENT OF FISH AND GAME

DESIGNATED WILD TROUT AND CATCH-AND-RELEASE WATERS
2001

Location/ Designated Water	Length (miles) or Area (acres)	Trout Species	Program Designation	Bag Limit	Size Limit Min.	Size Limit Max.
West Slope Sierra						
Yellow Creek	8	RT,BN	WT	5		
Yellow Creek	2	BN,RT,BK	WT,CR	2	10"	
M.F. Feather River	45	RT,BN	WT	5		
Nelson Creek	6	RT,BN	WT	5		
N.F. Yuba River	5	RT,BN	CR	2	10"	
Lavezzola Creek	12	RT,BN	WT	5		
N.F. American River	37	RT,BN	WT	5		
Rubicon River	30	RT,BN	WT	5		
M.F. Stanislaus River	2	RT,BN	WT,CR	2	14"	
M.F. Stanislaus River	2	RT,BN	WT,CR	2		
M.F. Stanislaus River	15	RT,BN	CR	2		
Lower Stanislaus River	12.5	RT	CR	0		
Tuolumne River	12	RT,BN	CR	2	12"	
Tuolumne River	8	RT,BN	CR	2	12"	
Clavey River	29	RT	HT	5		
Merced River	4	RT,BN	WT,CR	0,5 [5/]		
Merced River	10	RT,BN	CR	0,5 [5/]		
S.F. Merced River	16.5	RT,BN	WT	5		
M.F. San Joaquin River	7.6	RT,BN	WT	5		
Kings River	8	RT,BN	WT,CR	2		
Kings River	10	RT,BN	WT,CR	0		
S.F. Kings River	4	RT,BN	WT,CR	0		
S.F. Kings River	7	RT,BN	WT,CR	2		
S.F. Kings River	7	RT,BN	WT,CR	2		
S.F. Kings River	2	RT,BN	WT,CR	0,2 [6/]		
Marble Fork Kaweah River	8	RT,BN	CR	0,5 [5/]		
N.F. Tule River	6	RT,BN	CR	2		
Kern River	4	RT,BN	CR	2,0 [7/]	14"	
Kern River	15	RT,BN	CR	2	10" [8/]	
Kern River	45	RT,BN	CR,HT	2		10" [8/]
S.F. Kern River drainage	275.8 [9/]	GT	WT	5		
Golden Trout Creek drainage	92.3 [9/]	GT	HT	5		
Milton Lake	70	BN	CR	2	12"	

5/ Zero-bag limit for rainbow trout, 5 for brown trout.
6/ Zero-bag limit for rainbow trout, 2 for brown trout.
7/ 2-trout limit during regular season last Saturday in April through November 15; zero-bag limit from November 16 through last Friday in April.
8/ 10" MAXIMUM size limit for rainbow trout only, no size restriction for brown trout.

9/ The watershed above Dutch John Flat in the S.F. Kern and the entire Golden Trout Creek drainage were designated Wild Trout. Some of the stream mileage may be intermittent and some of the mileage may not support trout. Also, there are several small lakes within these watersheds.

APPENDIX F (continued)

CALIFORNIA DEPARTMENT OF FISH AND GAME
DESIGNATED WILD TROUT AND CATCH-AND-RELEASE WATERS
2001

Location/ Designated Water	Length (miles) or Area (acres)	Trout Species	Program Designation	Bag Limit	Size Limit Min.	Size Limit Max.
East Slope Sierra						
Truckee River	4	RT,BN	WT	2	15"	
Truckee River	4	RT,BN	WT,CR	2	15"	
Truckee River	4	RT,BN	WT,CR	2		
Little Truckee River	4	RT,BN	CR	2		14"
Upper Truckee River	4	CT	CR,HT	0		
Sagehen Creek	2	RT,BN,BK	CR	0		
E.F. Carson River	16	BK,RT,BN	WT	5		
E.F. Carson River	12	CT	WT	NF 10/		
E.F. Carson River	11	RT,BN	WT,CR	0		
East Walker River	9	BN,RT	CR	1	18"	
Upper Owens River	13	BN,RT	CR	2		16"
Hot Creek	1	BN,RT	WT,CR	0		
Lower Owens River	2.7	BN	WT,CR	2,0 11/		
Lower Owens River	7.4	BN	WT,CR	0		
Lower Owens River	5.9	BN	WT	5		
Cottonwood Creek(& tribs)	11	GT	WT	5		
Cottonwood Creek	4	GT	WT,CR	0		
Martis Lake	70	RT,BN,CT	WT,CR	0		
Heenan Lake	135	CT	CR,HT	0		
Kirman Lake	45	BK,CT	CR	2	16"	
Roosevelt Lake	8	BK,CT	CR	2		
Lane Lake	8	BK,CT	CR	2		
McLeod Lake	10	CT	CR	0		
Laurel Lakes	11.2	GT	WT,CR	2	14"	
Crowley Lake 10/	5,000	RT,BN	CR	2 12/	18"	
Cottonwood Lakes 1,2,3,4	7,5,22,25	GT	CR	0		
Southern California						
Sespe Creek	15	RT	WT	0		
Sespe Creek	10	RT,SH	WT	NF		
W.F. San Gabriel River	5.5	RT	CR	0		
Deep Creek	12	RT,BN	WT,CR	2	8"	
Deep Creek	4	RT,BN	CR	2	8"	

Bear Creek	9	BN,RT	WT,CR	2	8"
Piru Creek	1.25	RT	CR	0	

10/ Closed to fishing to protect threatened Lahontan cutthroat trout population above Carson Falls.
11/ Two-trout limit January 1 through September 30; zero limit October 1 through December 31.
12/ "Late Season" 2-trout limit runs August through October only--(5-trout limit in early season: last Saturday in April through July 31).

APPENDIX F (continued)

CALIFORNIA DEPARTMENT OF FISH AND GAME
DESIGNATED WILD TROUT AND CATCH-AND-RELEASE WATERS
2001

SUMMARY OF WILD TROUT PROGRAM WATERS

1. 33 designated Wild Trout stream segments total	844.2 miles
2. 41 designated Catch-and-Release stream segments total	458.15 miles
3 4 designated Heritage Trout stream segments	170.3 miles
4. Total designated WT, CR, and HT miles	1,097.45 miles *
5. 19 catch-and-release lakes	6,929.2 surface acres
6. 3 Wild Trout lakes (also catch-and-release lakes)	81.2 surface acres
7. 2 Heritage Trout lakes	28,135 surface acres

*The apparent total mileage discrepancy results because some streams are designated both WT and CR.

APPENDIX G

WATERS CONTAINING INLAND SALMON IN CALIFORNIA

Waters containing Kokanee

Lake/Reservoir	County
Bass	Madera
Boca [1/]	Nevada
Bucks [1/]	Plumas
Bullards Bar	Yuba
Camanche [2/]	San Joaquin
Don Pedro [1/]	Tuolumne
Donner [1/]	Nevada
Echo Lake (Upper Truckee) [1/]	El Dorado
Fallen Leaf	El Darado
Folsom [1/]	El Dorado
Hell Hole	Placer
Huntington [1/]	Fresno
Independence [1/]	Sierra/Nevada
Indian Valley	Colusa
Lewiston [2/]	Trinity
Little Grass Valley	Nevada
New Melones [1/]	Calaveras/Tuolumne
Pardee	Amador/Calaveras
Scotts Flat	Nevada
Shaver	Fresno
Stampede [1/]	Sierra
Tahoe [1/]	El Dorado
Trinity [1/]	Trinity
Twin Lakes (Upper and Lower) [1/]	Mono
Union Valley	El Dorado
Whiskeytown [1/]	Shasta

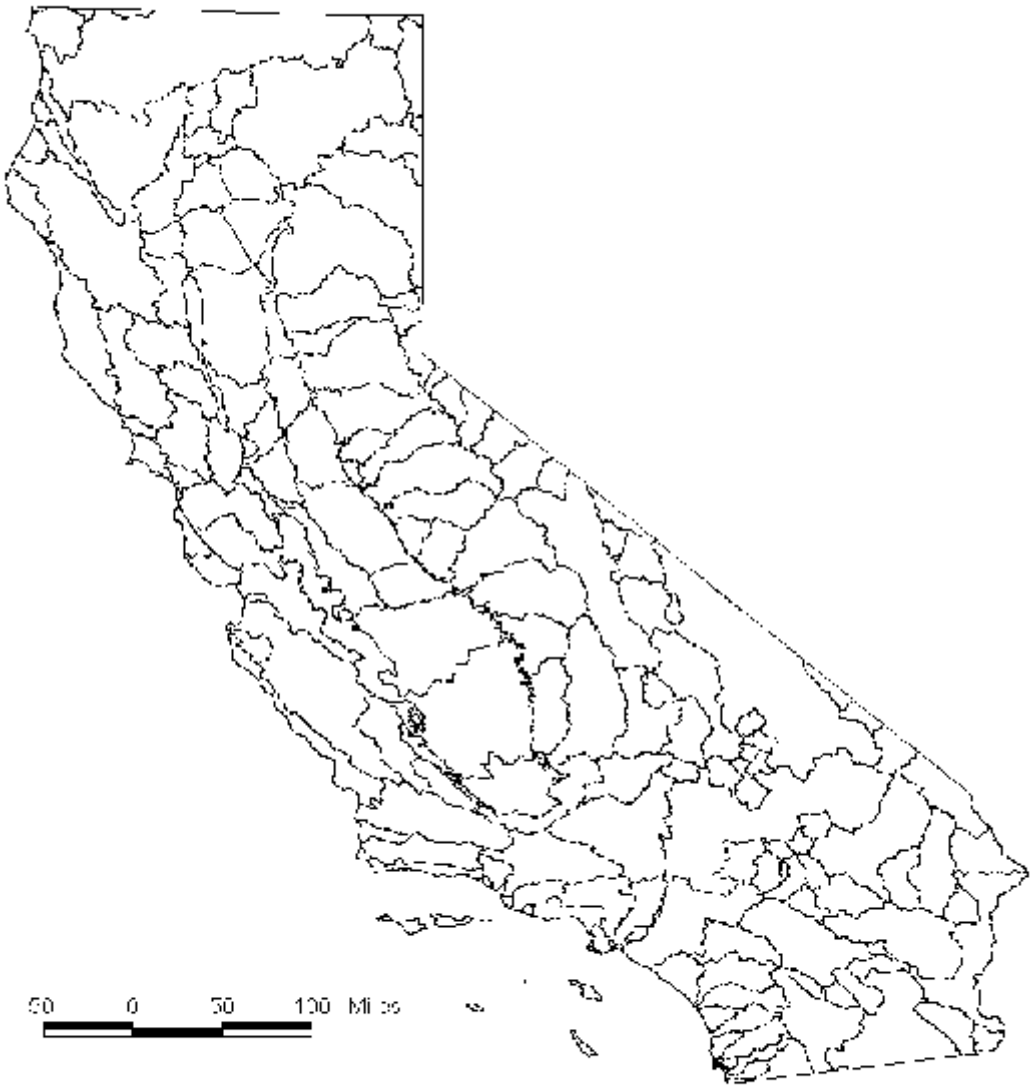
Waters containing chinook

Lake/Reservoir	County
Almanor	Plumas
Berryessa	Napa
Don Pedro	Tuolumne
Folsom	El Dorado
Isabella	Kern
McClure	Mariposa
Oroville	Butte
Pine Flat	Fresno
Shasta	Shasta
Spaulding	Placer
Stampede	Sierra
Trinity	Trinity

1/ Natural kokanee reproduction documented .

2/ Kokanee occasionally reported, most likely due to emigration from upstream sources.

APPENDIX H
CALIFORNIA WATERSHED MAP
Based on CalWater Hydrologic Units [1/]



1/ The California Watershed Map is a set of watershed boundaries nested into larger watersheds meeting standard delineation criteria. A Hydrologic Unit may encompass a major river watershed or a major groundwater basin, a contiguous watershed with similar hydrologic characteristics, or a closed drainage basin.

APPENDIX H (continued)

Hydrologic Units within Department of Fish and Game Regions

Northern California and North Coast Region

Ball Mountain	Mad River	Stony Creek
Butte Creek	Madeline Plains	Surprise Valley
Cape Mendocino	Mc Cloud River	Susanville
Cow Head Lake	Mountain Gate	Tehama
Duck Flat	Pit River	Trinidad
Eastern Tehama	Redding	Trinity River
Eel River	Redwood Creek	Upper Sacramento
Eureka Plain	Shasta Bally	Whitmore
Feather River	Shasta Dam	Winchuck River
Klamath River	Smith River	
Lakeview	Smoke Creek	

Sacramento Valley and Central Sierra Region

American River	Gopher Ridge	Suisun
Bear River	Lake Tahoe	Susanville
Butte Creek	Little Truckee River	Tehama
Cache Creek	Lower Calaveras	Truckee River
Carbona	Marysville	Upper Elmira
Colusa Basin	Middle Sierra	Upper Calaveras
Cortina	Middle West Side	Valley Putah-Cache
Delta-Mendota Canal	North Diablo Range	Valley American
East Fork Carson River	North Valley Floor	West Fork Carson River
Eastern Tehama	South Bay	West Walker River
Eel River	Stanislaus River	Yuba River
Feather River	Stony Creek	

Central Coast Region

Ball Mountain	Estrella River	San Mateo
Bay Bridges	Fellows	San Pablo
Big Basin	Grapevine	Santa Maria
Bolsa Neuva	Marin Coastal	Santa Clara
Cache Creek	Mendocino Coast	Santa Lucia
Cape Mendocino	Middle West Side	South Bay
Carbona	North Diablo Range	South Valley Floor
Carmel River	Pajaro River	Stony Creek
Carrizo Plain	Putah Creek	Suisun
Coast Range	Russian River	Sunflower Valley
Delta-Mendota Canal	Sacramento Delta	Temblor
Eel River	Salinas	Upper Elmira
Estero Bay	San Joaquin Delta	Valley Putah-Cache

APPENDIX H (continued)
Hydrologic Units within Department of Fish and Game Regions

San Joaquin Valley and Southern Sierra Region

Ahwahnee
Antelope
Carrizo Plain
Coast Range
Cuddeback
Delta-Mendota Canal
East Walker River
Estrella River
Fellows
Fremont
Gopher Ridge
Grapevine
Indian Wells
Kaweah River
Kern River
Kings River
Mariposa
Merced River
Middle West Side
Mojave
Mono
North Valley Floor
Owens
Pajaro River
Salinas
San Joaquin Delta
San Joaquin River
San Joaquin Valley Floor
Santa Maria
Santa Clara
Santa Clara-Calleguas
South Bay
South Valley Floor
Southern Sierra
Stanislaus River
Sunflower Valley
Temblor
Trona
Tuolumne River
West Walker River

South Coast Region

Antelope
Anza Borrego
Buena Ventura
Calleguas
Clark
Dominguez Channel
Grapevine
Imperial
Los Angeles River
Mojave
Otay
Oxnard Plain
Penasquitos
Pitas Point
Pueblo San Diego
San Antonio
San Diego
San Diego Bay
San Dieguito
San Garbriel River
San Jacinto Valley
San Juan
San Luis Rey
Santa Maria
Santa Ana River
Santa Clara-Calleguas
Santa Margarita
Santa Monica Bay
Santa Ynez
South Coast
Sweetwater
Tijuana
Ventura Coastal Streams
Ventura River
West Salton
Whitewater

Eastern Sierra and Inland Deserts Region

Adobe
Amargosa
Amos-Ogilby
Anza Borrego
Ballarat
Bicycle
Bessemer
Broadwell
Cadiz
Chemehuevis
Chuckwalla
Clark
Colorado
Coso
Coyote
Cuddeback
Dale
Davies
Deadman
Deep Springs
East Fork Carson River
East Walker River
Emerson
Eureka
Fish Lake
Fremont
Goldstone
Granite
Hayfield
Homer
Imperial
Indian Wells
Ivanpah
Johnson
Joshua Tree
Kern River
Kings River
Lavic
Leach
Lucerne Lake
Means
Merced River
Mesquite
Mojave
Mono
Owens
Owlshead
Pahrump
Race Track
Rice
Route Sixty Six
Saline
San Gabriel River
San Jacinto Valley
San Juan
San Luis Rey
Santa Ana River
Santa Margarita
Stanislaus River
Superior
Trona
Tuolumne River
Upper Cactus
Ward
West Walker River
Whitewater
Yuma

APPENDIX I
California Department of Fish and Game
Example of a trout water management classification system
DRAFT - FEBRUARY 10, 1999

NATURAL (WILD) TROUT WATERS

I. Native Trout Waters. These are waters within California where trout evolved over many centuries and where indigenous populations are present. Native trout waters represent some of the most historically valuable waters within the State.

Management of native trout waters involves a high degree of genetic protection. No introductions of exotic or domesticated fish species that have the potential for negatively affecting the native population are permitted. Habitat protection and restoration is the principal long term management strategy in these waters. Many of these waters are designated waters in the Wild Trout Program (includes Heritage Trout and catch-and-release waters). Angling regulations for these waters support the ability of the native trout population to be self-sustaining.

Examples of native species in stream systems where they historically evolved include: 1) California golden trout in the S.F. Kern River, 2) Little Kern R. golden trout in the Little Kern R., 3) Lahontan cutthroat trout in the Truckee River system, 4) Paiute cutthroat trout in Silver King Creek, 5) Eagle Lake rainbow trout in Eagle Lake, and 6) coastal rainbow trout in many waters throughout California. This classification also includes genetically significant populations of native trout that have been translocated to non-indigenous waters and represent a genetic refugia for a native species. Examples of genetically significant native trout populations outside of their native range include, 1) golden trout in Cottonwood lakes, and 2) Lahontan cutthroat in Heenan Lake.

This category does not include those waters presently containing native species where the species did not originate, and the population is not considered genetically significant. For example, waters not included in this classification include, 1) golden trout in high-elevation Sierra lakes, 2) coastal rainbow in the Mono basin, and 3) Eagle Lake rainbow trout in Lake Berryessa.

II. Natural Production Trout Waters. These are waters (may include stream reaches or entire streams) containing wild, self-sustaining populations of trout not indigenous to the specific water. Habitat protection and restoration is the principal management strategy in these waters. Trout populations are managed with the objective of perpetuating a self-sustaining population. No stocking of hatchery catchable-size trout is permitted. Many of these waters are designated waters in the Wild Trout Program (includes catch-and-release waters). Angling regulations for these waters support the ability of the natural trout population to be self-sustaining.

Examples of natural production waters include 1) brown trout in Hat Creek, Shasta County, 2) brown trout in Middle Fork Stanislaus River, 3) brown trout in the East Walker River in Mono County, 4) rainbow and brown trout in the Lower Owens River, 5) rainbow trout in the Truckee River, and 6) brook trout in high elevation lakes and streams of the Sierra Nevada.

HATCHERY SUPPORTED TROUT WATERS

III. Put-and-Grow Waters. These waters are capable of supporting trout growth and carry-over survival but have limited capacity for reproduction. In order to support a fishery, hatchery-produced trout 3-6 inches in length are stocked periodically to augment the population. This strategy is more typical of fisheries management implemented in lakes and reservoirs than in streams. Examples of these waters include 1) high-elevation lakes in the Sierras, and 2) reservoirs managed for trout and inland salmon, such as Lake Oroville and Lake Almanor.

APPENDIX I (continued)
California Department of Fish and Game
Example of a trout water management classification system

IV. Hatchery production waters. These waters are stocked with catchable-sized hatchery trout, because they are either unable to support sufficient reproducing or self-sustaining trout populations to support a satisfactory sport fishery, or waters near campgrounds, roadsides or other high access areas where angling demand is high. These waters are stocked to satisfy intense recreational demand and to satisfy anglers interested in keeping some fish. The fishery management objectives are to:

1. Stock catchable trout where at least 50 percent will be harvested.
2. Stock catchable trout where recreational benefits are significant (Recreational benefits are measured by generating [number to be determined] angler days per each trout stocked).

Note: Some waters may have more than one classification.
Should waters that we want to return to or maintain in a non-trout state be uniquely identified?

APPENDIX J

GLOSSARY OF TERMS

Anadromous. Characterizes the life cycle of a fish that spawns in freshwater and spends a significant portion of its adult life in the ocean. Steelhead trout are anadromous.

Biodiversity. Biological diversity. The natural variety of plants and animals that includes 1) genetic diversity, 2) species diversity, 3) ecosystem diversity, and 4) landscape diversity. Optimum biodiversity is that which occurs naturally in an undisturbed system. The key words are "natural and undisturbed". It concerns biological integrity within a system and not necessarily a large variety of species. Managers should be concerned with the loss of natural biodiversity rather than absolute numbers of species.

Catchable trout. Refers to a size category of hatchery-produced trout. Although the Fish and Game Operations Manual defines "catchable" trout as six-per-pound or larger, current policy dictates catchable trout weigh one-half pound each, on average (about 10 to 12 inches in length). Catchable trout are used in put-and-take managed fisheries, and are expected to be harvested by anglers soon after planting.

Catch-and-release. This is a management strategy and fishing technique where anglers are encouraged, through a zero to two-fish bag limit, to immediately release all captured fish back into the water. Effective catch-and-release angling requires fishing gear consisting of barbless hooks and artificial lures only (i.e., no bait). Catch-and-release allows anglers the opportunity to enjoy trout fishing in waters that cannot support significant harvest and where large numbers or sizes of trout provide high quality angling.

Domesticated trout. Strains of hatchery-produced trout that have been reproduced and reared in the hatchery environment for several generations. These strains generally exhibit qualities that are suitable within the fish culture environment, and can withstand the rigors of handling and planting.

Ecosystem. A broad scale landscape that includes all biological, chemical, and physical elements and their dynamic interactions with one another. An example of an ecosystem is an entire watershed, ridge top to ridge top. Examples of sub-ecosystems within the greater watershed ecosystem include stream, riparian, and forest ecosystems. These systems are interconnected and "upslope" systems generally influence systems "downslope". Because the stream ecosystem is the most "downslope" system, the condition of the stream ecosystem generally indicates if other sub-systems and processes within the entire ecosystem are functioning properly.

Fingerling. A trout approximately 2 ½ to 4 inches in length and weighing 16 per pound or smaller. This size category is stocked by truck in put-and-grow trout fisheries where trout growth potential is high. Only fingerlings are used in the aerial planting program.

APPENDIX J (continued)

GLOSSARY OF TERMS

Hatchery trout. Any wild or native trout hatched and reared in a hatchery environment. However, anglers often use this term exclusively for domesticated strains of trout reared to a catchable size and used in put-and-take fisheries.

Inland trout. Non-anadromous trout or trout that do not migrate to the ocean. Same as resident trout.

Native trout. Trout species present in streams and watersheds within California prior to European settlement, and that have a defined natural range without human intervention.

Non-native trout. Trout species that have been introduced into waters of California from original sources outside of California or outside of their historic range.

Put-and-take management. This management technique is used in waters that are easily accessible to the general public, where angling demand is high, and where habitat conditions are not suitable to support a satifactory fishery. Catchable-sized trout are planted in selected waters and at least half of the trout released are expected to be harvested.

Put-and-grow management. This management technique is used in waters were reproduction capability is limited but habitat conditions support good growth and survival of juveniles and adults. Trout smaller than catchables are planted in appropriate waters where they will utilize existing food resources to grow to a larger size. Hatchery-produced fingerlings or sub-catchables of wild or semi-wild strains are used in put-and-grow managed waters.

Resident trout. Trout that do not emigrate from freshwater. Non-anadromous trout. Resident trout typically remain within the stream and/or lake system in which they originated.

Steelhead trout. Coastal rainbow trout (*Oncorhynchus mykiss irideus*) that exhibit an anadromous life cycle.

Sub-catchable trout. A hatchery-produced trout less than six inches in length and weighing between 6.1 and 16 fish per pound. This size category of trout is used in put-and-grow managed fisheries where planted trout are expected to survive and grow to a larger size before being harvested by anglers.

Wild trout. Includes any trout (native or non-native) that is a product of parents that spawned naturally and has spent its entire life in a natural stream or lake environment. Wild trout may include the offspring of hatchery trout that reproduced in a natural environment.